

Mt Arthur Coal



Appendix L – Environmental Risk Assessment

Mt Arthur Coal Open Cut Modification

Environmental Risk Assessment

Prepared for: Hunter Valley Energy Coal, Mt Arthur Coal Open Cut Modification

Prepared by: Safe Production Solutions
Author: Dr Peter Standish

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Safe Production Solutions Pty. Ltd.
ABN: 16 097 038 296
155 Birch Avenue
Dubbo NSW 2830
NSW AUSTRALIA 2830

Tel: +61 2 6885 6611
Fax: +61 2 6885 6011
Web Site: www.spsolutions.com.au
E-mail: sps@spolutions.com.au

Mt Arthur Coal Open Cut Modification – Environmental Risk Assessment

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1 INTRODUCTION

This document is an Environmental Risk Assessment (ERA) which identifies risks associated with key potential environmental issues associated with the Mt Arthur Coal Open Cut Modification (the Modification).

The Mt Arthur Coal Mine is located south-west of Muswellbrook in the Upper Hunter Valley of New South Wales (NSW). The Modification is a proposed continuation of open cut mining operations at the Mt Arthur Coal Mine for an additional operational life of approximately four years.

The Modification consists of the following:

- a four year continuation of the open cut mine life from 2022 to 2026 at the currently approved rate of 32 million tonnes per annum;
- an increase in open cut disturbance areas;
- use of the conveyor corridor for overburden emplacement;
- duplication of the existing rail loop;
- an increase in the maximum number of train movements per day from 24 to 38;
- the relocation of the load point for the overland conveyor which delivers coal to Macquarie Generation's Bayswater Power Station;
- the relocation and upgrade of the explosives storage, magazine and associated facilities; and
- the construction of additional offices and a control room, and a small extension to the run-of-mine coal stockpile footprint.

1.1 METHODOLOGY

On 21 June 2012, a team consisting of Hunter Valley Energy Coal (HVEC) personnel and specialist consultants participated in a facilitated ERA workshop. Consistent with the Director-General's Requirements for the Modification, the scope of the workshop was to conduct a:

Risk assessment of the potential environmental impacts of the proposal, identifying the key issues for further assessment;

In 2009, an ERA was undertaken for the Mt Arthur Consolidation Project (Consolidation Project) Environmental Assessment (EA) HVEC (2009). Due to the comprehensive and contemporary nature of the Consolidation Project ERA, the methodology used for this ERA included:

- Using a process aligned with GLD.017 *Risk Management* (BHP Billiton, 2012), review the outcomes of the Consolidation Project ERA (HVEC, 2009), identifying any additional issues associated with the Modification.
- Re-rank relevant issues in accordance with GLD.017.

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The ERA workshop included:

1. Establishing the context, including the review of supporting information and objectives.
2. Identifying risks via a number of risk management techniques, including:
 - a. brainstorming;
 - b. review of the Consolidation Project ERA; and
 - c. keyword (loss generation) techniques.
3. Analysis of identified risks and nomination of key potential environmental issues.
4. Ranking of the risks, including consideration of mitigation measures.

1.2 ERA TEAM

The team met for the ERA workshop at the HVEC meeting room on 21 June 2012. A team-based approach was utilised in order to have an appropriate mix of skills and experience to identify the potential environmental issues and potential loss scenarios. Details of the team members and their relevant qualifications and experience are included in **Table 1**.

Table 1 - ERA Team

Name	Position Details
Peter Standish	SP Solutions. Over 34 years mining experience, PhD, B Eng (Mine) 1st class certificate of competency - Risk Engineering work since 1996.
David Laundy	SP Solutions. Engineering background and over 20 years industrial experience. Involved in Risk Assessments for 12 months.
Rob Hayes	HVEC - Manager MAC32 Operations. Formal engineering qualifications and over 20 years mining industry experience.
Geoff Wickens	HVEC - Manager of Export Infrastructure. Formal engineering qualifications and over 20 years industry experience.
Darren Stacey	HVEC - Principal Mining Engineer. Formal engineering qualification and over 20 years industry experience.
Sarah Bailey	HVEC - Approvals Manager. Formal science and environmental qualifications and over 10 years industry experience.
Matt Cooper	HVEC - Head of Projects - Formal engineering qualifications and over 20 years industrial experience.
Greg Taylor-Adams	HVEC - Contractor and Risk Superintendent. Formal HSC qualifications and over 20 years industrial experience.
Shelley Masterson	HVEC - Community Superintendent. Formal qualifications and over 10 years industry experience.
Julie McNaughton	HVEC - Environment and Community Manager. Formal qualifications and over 10 years industry experience.
Simon Davis	HVEC - Technical Services Manager. Formal engineering qualifications and over 20 years industry experience.
Josh Hunt	Resource Strategies - Principal. BE (Civil). Over 20 years experience in engineering, environmental management and approvals.
Clive Berry	Resource Strategies - Senior Environmental Manager. BE (Environmental). Over 10 years experience environmental management and project approvals in the resource industry.
Jamie Gleeson	Resource Strategies - Environmental Manager (Senior Ecologist). BSc (Ecology)(Hon). Over 10 years experience in ecological assessment and environmental management in the resource industry.

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2 KEY POTENTIAL ENVIRONMENTAL ISSUES

Key potential environmental issues were identified by the ERA team by identifying key relevant issues from the Consolidation Project ERA and additional issues specific to the Modification. The key potential environmental issues identified by the ERA team (**Table 2**) were considered to be key issues for further assessment in the EA.

Table 2 - Key Potential Environmental Issues to be Further Assessed in the EA

Ref	Issue	Aspect & Impact	EA Study Area
IS-001	Air Quality	Vegetation clearing, drilling and topsoil stripping. Impacting through - wind blown dust and machinery exhaust fumes contributing to elevated dust levels in excess of applicable criteria.	Appendix F
IS-002	Air Quality	Overburden emplacement. Impacting through - wind blown dust and machinery exhaust fumes contributing to elevated dust levels in excess of applicable criteria.	Appendix F
IS-004	Air Quality	Coal, rejects and overburden haulage. Impacting through - dust emissions and machinery exhaust fumes contributing to elevated dust levels.	Appendix F
IS-015	Acoustics	Plant and equipment working in-pit and on overburden dumps. Impacting through - noise generation in excess of applicable criteria.	Appendix G
IS-016	Acoustics	Train movements on rail loop and spur. Impacting through - noise generation in excess of applicable criteria.	Appendix G
IS-019	Acoustics	Stationary trains on the Antiene rail spur. Impacting through - noise generation in excess of applicable criteria.	Appendix G
IS-021	Acoustics	Rail noise impacts on the Main Northern Railway due to an increase in peak train movements. Impacting through - noise generation in excess of applicable criteria.	Appendix G
IS-022	Acoustics	Construction noise for duplication of rail loop. Impacting through - noise generation in excess of applicable criteria.	Appendix G
IS-027	Ecology	Vegetation clearing, drilling and topsoil stripping. Impacting through - loss of biodiversity and disruption to threatened flora and fauna or habitats.	Appendix D
IS-031	Cultural Heritage	Vegetation clearing, drilling and topsoil stripping. Impacting through - disturbance of Aboriginal objects, sites or places of cultural significance.	Appendix E
IS-032	Water Management	Loss of catchment from Saddlers Creek due to conveyor corridor overburden emplacement. Impacting through - failure of water management controls and release of dirty water into the creek.	Appendix C
IS-033	Water Management	Loss of catchment from Saddlers Creek due to conveyor corridor overburden emplacement. Impacting through - excision of catchment results in loss of surface water flow.	Appendix C
IS-034	Water Management	Loss of catchment associated with the Whites Creek diversion. Impacting through - excision of catchment results in loss of surface water flow.	Appendix C
IS-035	Water Management	Conveyor corridor overburden emplacement would occur on mapped Saddlers Creek alluvium. Impacting through - potential for degradation of groundwater quality in Saddlers Creek alluvium due to conveyor corridor overburden emplacement.	Appendix B
IS-037	Water Management	Coal extraction and overburden removal. Impacting through - additional groundwater inflow into pit.	Appendix B
IS-054	Traffic and Transport	Increased vehicle movements from employees, deliveries and train loading. Impacting through - increased traffic movements associated with the use of the proposed access to the explosives facility off Edderton Road.	Appendix K
IS-061	Hazardous materials	Explosives magazine and storage area would be moved under the Modification. Impacting through - off-site impacts due to explosives magazine.	Section 4 in the Main Report of the EA
IS-064	Agricultural Impacts	A portion of the Modification disturbance area potentially mapped as Biophysical Strategic Agricultural Land - direct impacts of mining activities. Impacting through - impacts on Biophysical Strategic Agricultural Land.	Appendix A
IS-065	Agricultural Impacts	A portion of the Modification disturbance area potentially mapped as Biophysical Strategic Agricultural Land - indirect impacts of mining activities (such as dust generation and groundwater drawdown). Impacting through - impacts on Biophysical Strategic Agricultural Land.	Appendix A

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The key potential environmental issues identified in the ERA would be addressed in the EA, and its supporting specialists reports included as appendices to the EA:

- Appendix A – Agricultural Impact Statement.
- Appendix B – Groundwater Impact Assessment.
- Appendix C – Surface Water Assessment.
- Appendix D – Ecological Assessment.
- Appendix E – Aboriginal and Non-Indigenous Cultural Heritage Assessment.
- Appendix F – Air Quality and Greenhouse Gas Assessment.
- Appendix G – Noise and Blasting Assessment.
- Appendix H – Landscape and Visual Impact Assessment.
- Appendix I – Geochemistry Assessment of Overburden and Interburden.
- Appendix J – Socio-Economic Assessment.
- Appendix K – Road Transport Assessment.
- Appendix L – Environmental Risk Assessment.

The process applied for the study is shown on Figure 1.

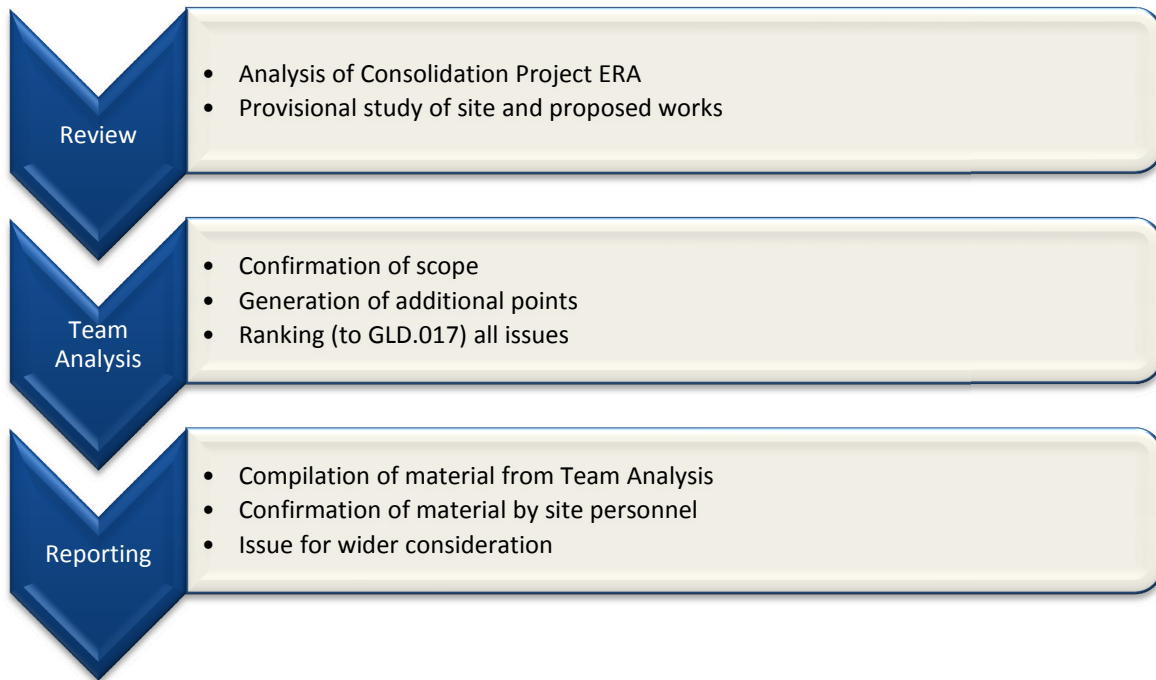


Figure 1 - Risk Assessment Method Applied

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2.1 RISK ANALYSIS

Measures of maximum reasonable consequence and likelihood used for the ERA were taken from BHP Billiton (2012) and are presented as **Tables 3** and **4**, respectively.

Table 3 - Measures of Maximum Reasonable Consequence

Severity Level	Environment	Social and Cultural	Severity Factor
7	Unplanned permanent environmental impact over extensive area. Permanent loss of ecosystem or extinction of species.	Complete breakdown of social order. Widespread desecration of items of global cultural significance. Company directly responsible or complicit in severe, and widespread long-term impacts on human rights.	1000
6	Unplanned severe impact (>20 years) on ecosystem or threatened species.	A breakdown of social order. Widespread damage to items of global cultural significance. Highly offensive infringements of cultural heritage. Company directly responsible or complicit in severe, long-term impacts on human rights.	300
5	Unplanned serious or extensive impact (<20 years) on ecosystem or threatened species.	Extensive long-term social impacts. Widespread damage to structures/items/locations of national cultural significance. Serious infringements of cultural heritage. Company directly responsible or complicit in multiple aggravated impacts on human rights.	100
4	Unplanned major impact (<5 years) on ecosystem or threatened species.	Major long-term social impacts or on-going social issues. Damage to structures/items of national cultural significance. Major infringement and disregard of cultural heritage. Company directly responsible or complicit in major human rights impacts.	30
3	Unplanned moderate impact (< 1 year) to ecosystem or non-threatened species.	Moderate medium-term social impacts or frequent social issues. Moderate damage to structures/items of local cultural significance. Moderate infringement of cultural heritage/sacred locations. Moderate, temporary human rights impacts.	10
2	Unplanned minor impact (< 3 months) to non-threatened species or their habitat.	Minor medium-term social impacts on a small number of people. Minor repairable damage or disturbance to property, structures, or items. Minor infringement of cultural heritage. Minor, temporary human rights impacts.	3
1	Unplanned low level environmental impact.	Low-level social impacts. Low-level infringement of cultural heritage or minimal disturbance to heritage structures. Minimal impact on human rights.	1

Source: BHP Billiton (2012).

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Table 4 - Measures of Likelihood

Operations Given the site, BHP Billiton and industry experience, it:	Uncertainty description	Projects Based on BHP Billiton and industry experience with similar studies or projects, the risk event:	Likelihood factor
Could be incurred more than once in a year.	Almost certain	Could be expected to occur more than once during the study or project delivery.	10
Could be incurred over a 1 to 2 year budget period.	Likely	Could easily be incurred and has generally occurred in similar studies or projects.	3
Could be incurred within a 5 year strategic planning period.	Possible	Incurred in a minority of similar studies or projects.	1
Could be incurred within a 5 to 10 year time frame.	Unlikely	Known to happen, but only rarely.	0.3
Could be incurred in a 20 to 30 year timeframe.	Rare	Has not occurred in similar studies or projects, but could.	0.1
For a system failure: This consequence has not happened in the industry in the last 50 years. For a natural hazard: The predicted return period for a <i>risk event</i> of this strength/magnitude is one in 100 years or longer.	Very rare	Conceivable, but only in extreme circumstances.	0.03

Source: BHP Billiton (2012).

Combining the consequence and likelihood factors provides an overall risk level.

Consistent with BHB Billiton (2012), risk acceptance criteria (tolerability levels) assumed for this ERA were as follows:

Maximum Asset Tolerable Risk	90
Maximum Group Tolerable Risk	300

(Note: the above Tolerability thresholds are contingent upon the control rating, as described in BHP Billiton [2012]).

2.2 MODIFICATION RISK RANKING

Risk ranking was undertaken by the team on loss scenarios taken from the Consolidation Project ERA and additional issues raised for the Modification. A summary of the risk ranking results is presented in **Table 5**.

With the consideration of potential controls, all of the potential loss scenarios associated with the Modification were ranked at a level considered tolerable for management at the site level (within the “Medium - As Low As Reasonably Practicable” or the “Low” range) by the ERA team. These are presented below.

2.3 REFERRED ISSUE

Where issues raised during the ERA workshop were outside the scope of the ERA or outside of the Modification scope, and therefore not considered to be key potential environmental issues, these “referred issues” were considered to warrant consideration in the development of the EA.

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Table 5 – Risk Ranking

Ref	Issue	Aspect and Impact	Dimension	Proposed Additional Control Measures for Modification	Risk		
					C	L	R
IS-001	Air Quality	Vegetation clearing, drilling and topsoil stripping. Impacting through - wind blown dust and machinery exhaust fumes contributing to elevated dust levels in excess of applicable criteria.	Environment	As per Consolidation Project.	3	3	9
IS-002	Air Quality	Overburden emplacement. Impacting through - wind blown dust and machinery exhaust fumes contributing to elevated dust levels in excess of applicable criteria.	Environment	As per Consolidation Project.	3	10	30
IS-003	Air Quality	Uncovering of coal. Impacting through - wind blown dust and machinery exhaust fumes contributing to elevated dust levels.	Environment	As per Consolidation Project.	3	10	30
IS-004	Air Quality	Coal, rejects and overburden haulage. Impacting through - dust emissions and machinery exhaust fumes contributing to elevated dust levels.	Environment	As per Consolidation Project.	3	10	30
IS-005	Air Quality	Coal processing and transport. Impacting through - wind blown dust and machinery exhaust fumes contributing to elevated dust levels.	Environment	As per Consolidation Project.	1	10	10
IS-006	Air Quality	Rail loop operations and rail freight and construction of rail loop. Impacting through - air borne dust generated from rail movements and loading.	Environment	Additional controls - involvement in the broader industry rail movement groups addressing rail movement impacts. The team noted that whilst the Modification would allow for more HVEC train movements in a given period, in reality the train paths available on the Main Northern Railway are determined by the Australian Rail Track Corporation and therefore overall (cumulative) trains would generally not be increased in practice.	1	10	10
IS-007	Air Quality	Coal handling and preparation plant (CHPP) operation and stockpiles. Impacting through - wind blown dust and machinery exhaust fumes contributing to elevated dust levels.	Environment	Additional operational commitments to be applied to the Modification would include real-time monitoring to manage noise levels at adjacent private property.	3	10	30
IS-008	Air Quality	Combustion of diesel fuel. Impacting through - greenhouse gas emissions.	Environment	As per Consolidation Project.	3	10	30
IS-009	Air Quality	Electricity use. Impacting through - greenhouse gas emissions.	Environment	As per Consolidation Project.	1	10	10
IS-010	Air Quality	Downstream impacts from the burning of coal. Impacting through - greenhouse gas emissions.	Environment	As per Consolidation Project.	3	10	30
IS-011	Air Quality	Spontaneous combustion. Impacting through - heating, vegetation scalding, emissions to air, odours.	Environment	As per Consolidation Project.	3	1	3

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Ref	Issue	Aspect and Impact	Dimension	Proposed Additional Control Measures for Modification	Risk		
					C	L	R
IS-012	Air Quality	Spontaneous combustion. Impacting through - heating, vegetation scalding, emissions to air and odours.	Environment	As per Consolidation Project.	1	1	1
IS-013	Air Quality	Blasting. Impacting through - greenhouse gas emissions, fume and dust generation.	Environment	Additional blasting controls would be applied to the Modification, including restricting blast events in sensitive areas and during unfavourable weather conditions to minimise impacts.	3	10	30
IS-014	Acoustics	Coal, rejects and overburden haulage. Impacting through - excessive noise generation.	Environment	Additional management controls would be applied to the Modification, including a range of mine planning, operational and engineering measures, real-time monitoring and alarm systems.	3	10	30
IS-015	Acoustics	Plant and equipment working in-pit and on overburden dumps. Impacting through - noise generation in excess of applicable criteria.	Environment	As per Consolidation Project.	3	10	30
IS-016	Acoustics	Train movements on rail loop and spur. Impacting through - noise generation in excess of applicable criteria.	Environment	As per Consolidation Project.	3	10	30
IS-017	Acoustics	CHPP operation and stockpiles. Impacting through - excessive noise generation.	Environment	As per Consolidation Project.	1	10	10
IS-018	Acoustics	Coal loading at rail loop. Impacting through - excessive noise generation.	Environment	As per Consolidation Project.	3	10	30
IS-019	Acoustics	Stationary trains on the Antiene rail spur. Impacting through - noise generation in excess of applicable criteria.	Environment	Additional control for the Modification positive identification of all HVEC trains that gives location of all trains - allowing for complaint verification and response.	3	3	9
IS-020	Acoustics	Increased traffic movements. Impacting through - excessive noise generation.	Environment	As per Consolidation Project.	1	10	10
IS-021	Acoustics	Rail noise impacts on the Main Northern Railway due to an increase in peak train movements. Impacting through - noise generation in excess of applicable criteria.	Environment	As per Consolidation Project.	3	3	9
IS-022	Acoustics	Construction noise for duplication of rail loop. Impacting through - noise generation in excess of applicable criteria.	Environment	Additional control for the Modification - daytime only heavy construction with minor activities at night.	1	3	3
IS-023	Acoustics	Blasting. Impacting through - Overpressure and ground vibration impacts at near neighbours and heritage properties.	Environment	As per Consolidation Project.	3	3	9
IS-024	Change in landscape	Overburden stockpile dumps. Impacting through - visual.	Environment	As per Consolidation Project.	3	10	30
IS-025	Change in landscape	Exposed earthworks. Impacting through - visual.	Environment	As per Consolidation Project.	3	10	30

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Ref	Issue	Aspect and Impact	Dimension	Proposed Additional Control Measures for Modification	Risk		
					C	L	R
IS-026	Change in landscape	Lighting from mobile and fixed equipment. Impacting through - visual.	Environment	As per Consolidation Project.	1	10	10
IS-027	Ecology	Vegetation clearing, drilling and topsoil stripping. Impacting through - loss of biodiversity and disruption to threatened flora and fauna or habitats.	Environment	Additional control for the Modification - offset areas to be augmented/ expanded.	1	10	10
IS-031	Cultural Heritage	Vegetation clearing, drilling and topsoil stripping. Impacting through - disturbance of Aboriginal objects, sites or places of cultural significance.	Environment	As per Consolidation Project.	3	1	3
IS-032	Water Management	Loss of catchment from Saddlers Creek due to conveyor corridor overburden emplacement. Impacting through - failure of water management controls and release of dirty water into the creek.	Environment	As per Consolidation Project.	3	1	3
IS-033	Water Management	Loss of catchment from Saddlers Creek due to conveyor corridor overburden emplacement. Impacting through - excision of catchment results in loss of surface water flow .	Environment	As per Consolidation Project.	3	1	3
IS-034	Water Management	Loss of catchment associated with the Whites Creek diversion. Impacting through - excision of catchment results in loss of surface water flow.	Environment	As per Consolidation Project.	3	1	3
IS-035	Water Management	Conveyor corridor overburden emplacement would occur on mapped Saddlers Creek alluvium. Impacting through - potential for degradation of groundwater quality in Saddlers Creek alluvium due to conveyor corridor overburden emplacement.	Environment	As per Consolidation Project.	1	1	1
IS-036	Water Management	Topsoil stripping, haul roads, un-rehabilitated spoil. Impacting through - dirty water runoff entering local waterways.	Environment	As per Consolidation Project.	3	0.3	0.9
IS-037	Water Management	Coal extraction and overburden removal. Impacting through - additional groundwater inflow into pit.	Environment	As per Consolidation Project.	10	0.3	3
IS-038	Water Management	Coal extraction and overburden removal. Impacting through - drawdown of aquifers on surrounding water users.	Social	As per Consolidation Project.	3	0.3	0.9
IS-039	Water Management	Coal extraction and overburden removal. Impacting through - cumulative impacts with surrounding users.	Social	As per Consolidation Project.	10	0.3	3
IS-040	Water Management	Increase in production, coal processing and intensification of operations. Impacting through - additional water demand for dust suppression and coal washing.	Social	As per Consolidation Project.	10	1	10
IS-041	Water Management	Water discharges into local waterways. Impacting through - surface water contamination.	Environment	As per Consolidation Project.	10	0.3	3
IS-042	Water Management	Water discharges into local waterways. Impacting through - contaminated water from wash down bays.	Environment	As per Consolidation Project.	3	0.3	0.9

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Ref	Issue	Aspect and Impact	Dimension	Proposed Additional Control Measures for Modification	Risk		
					C	L	R
IS-043	Mine Rehabilitation	Final Voids. Impacting through - impacts associated with final voids.	Environment	As per Consolidation Project. Additional control for the Modification - elimination of Saddlers Pit final void (improvement).	3	10	30
IS-044	Mine Rehabilitation	Topsoil Stripping and land preparation. Impacting through - loss of productive topsoil.	Environment	As per Consolidation Project.	3	10	30
IS-045	Mine Rehabilitation	Impacting through - deterioration of land capability.	Environment	As per Consolidation Project.	3	10	30
IS-046	Mine Rehabilitation	Impacting through - erosion.	Environment	As per Consolidation Project.	3	3	9
IS-047	Mine Rehabilitation	Impacting through - invasion of weed species.	Environment	As per Consolidation Project.	3	3	9
IS-048	Mine Rehabilitation	Impacting through - invasion of feral animals.	Environment	As per Consolidation Project.	3	3	9
IS-049	Mine Rehabilitation	Impacting through - acid rock drainage.	Environment	As per Consolidation Project.	10	3	30
IS-050	Mine Rehabilitation	Impacting through - unstable landform.	Environment	As per Consolidation Project.	10	3	30
IS-051	Mine Rehabilitation	Impacting through - poor drainage.	Environment	As per Consolidation Project.	10	3	30
IS-054	Traffic and Transport	Increased vehicle movements from employees, deliveries and train loading. Impacting through - increased traffic movements associated with the use of the proposed access to the explosives facility off Edderton Road.	Social	A Road Transport Assessment would be conducted for the Modification, including a review of the capacity of the affected road network to cater for differing traffic volumes due to the proposed change in traffic flows. Road enhancements and mitigation measures would be identified as required.	3	3	9
IS-057	Waste	General waste management. Impacting through - land contamination.	Environment	As per Consolidation Project.	3	1	3
IS-058	Waste	Rejects management. Impacting through - water contamination.	Environment	As per Consolidation Project.	10	1	10
IS-059	Waste	Sewage management. Impacting through - water contamination.	Environment	As per Consolidation Project.	3	1	3
IS-060	Hazardous materials	Storage and Handling. Impacting through - soil and water contamination.	Environment	As per Consolidation Project.	3	1	3
IS-061	Hazardous materials	Explosives magazine and storage area would be moved under the Modification. Impacting through - off-site impacts due to explosives magazine.	Environment	As per Consolidation Project. It is not anticipated that additional quantities of hazardous materials would be required for the Modification.	3	3	9

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Ref	Issue	Aspect and Impact	Dimension	Proposed Additional Control Measures for Modification	Risk		
					C	L	R
IS-062	Agricultural Impacts	Modification disturbance area mapped as Equine Critical Industry Cluster - indirect impacts of mining activities (dust, etc). Impacting through - impacts on Equine Critical Industry Cluster.	Environment	Land affected owned by HVEC Rehabilitation of site to include agricultural areas.	1	3	3
IS-063	Agricultural Impacts	Coal and overburden removal. Impacting through - indirect impacts of mining activities. Impacting through - viticultural impacts.	Environment	Land affected owned by HVEC Rehabilitation process.	1	3	3
IS-064	Agricultural Impacts	A portion of the Modification disturbance area mapped as Biophysical Strategic Agricultural Land. Coal and overburden removal. Impacting through - direct impacts of mining activities. Impacting through - impacts on Biophysical Strategic Agricultural Land.	Environment	Ongoing analysis of the impacts on the land rehabilitation process.	1	30	30
IS-065	Agricultural Impacts	A portion of the Modification disturbance area mapped as Biophysical Strategic Agricultural Land. Coal and overburden removal. Impacting through- indirect impacts of mining activities (dust, groundwater drawdown, etc). Impacting through - impacts on Biophysical Strategic Agricultural Land.	Environment	Land affected owned by HVEC.	1	3	3
IS-066	Social/ Community	Cumulative social impacts of mining as industry grows within the Hunter Valley region.	Community	Ongoing understanding and monitoring of cumulative social impacts. Involvement in broader industry initiatives to manage cumulative social impacts.	3	10	30

Notes: C – consequence, L – likelihood, R – risk.

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Community perceptions of HVEC's environmental management and community relations initiatives were noted as a referred issue. In particular, the increasing trend of receipt of complaints was noted. The environmental impacts (including air quality, noise and blasting) were assessed in this ERA, however it was noted that the perception of these issues in some aspects of the community may differ from the team. Community engagement issues are addressed in the Modification stakeholder engagement strategy (Communications Plan). The outcomes of stakeholder engagement undertaken for the Modification are outlined in Section 1 of the Main Report of the EA. This section also describes HVEC's community initiatives and complaints response process.

3 MONITOR AND REVIEW

3.1 NOMINATED CO-ORDINATOR

The nominated client review facilitator is Sarah Bailey, Approvals Manager, HVEC.

It is understood the nominee would co-ordinate the inclusion of the key potential environmental issues into the various studies undertaken as part of the EA and the overall HVEC management systems.

3.2 COMMUNICATION AND CONSULTATION

Consultation, involvement of personnel (HVEC and their specialists) and communication of the process and outcomes of the ERA are intended to be achieved by the inclusion of this report and the relevant specialist assessments addressing the key potential environmental issues in the EA and the overall HVEC management systems.

3.3 CONCLUDING REMARKS

The risk assessment process conducted by the team was aligned with Australian Standard/New Zealand Standard (AS/NZS) 31000:2009 *Risk Assessment – Principles and Guidelines*, GLD.017 *Risk Management* (BHP Billiton, 2012) and MDG1010 *Minerals Industry Safety and Health Risk Management Guideline* (NSW Department of Trade and Investment, 2011), with the intention of identifying the key potential environmental issues for the Project to be further assessed in the EA.

An appropriately detailed assessment of the key potential environmental issues would be included in the EA appendices/sections, as presented in **Table 2**.

The risk rankings indicate that the loss scenarios ranked were within the site tolerable range and met the broader requirements of being the "Medium – As Low As Reasonably Practicable" or the "Low" range.

SP Solutions would like to thank all of the personnel who contributed to the risk assessment in particular those personnel from HVEC and Resource Strategies who prepared source material for the team session.



Peter Standish, December 2012

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4 REFERENCES

BHP Billiton (2012) *GLD.017 Risk Management*.

Department of Trade and Investment (2011) *MDG1010 Minerals Industry Safety and Health Risk Management Guideline*.

Hunter Valley Energy Coal Pty Ltd (2009) *Mt Arthur Consolidation Project Environmental Assessment*.

Mt Arthur Coal Open Cut Modification – Environmental Risk Assessment

ATTACHMENT A – DEFINITIONS

Term	Explanation
As Low As Reasonably Practicable	The level of risk between tolerable and intolerable levels that can be achieved without expenditure of a disproportionate cost in relation to the benefit gained.
AS/NSZ 31000:2009	Australian Standard/New Zealand Standard on Risk Management.
Control	An intervention by the proponent intended to either Prevent a Cause from becoming an incident or to reduce the outcome should an incident occur.
ERA	Environmental Risk Assessment.
MDG1010	Department of Trade and Investment guideline on risk management.
Outcome	The end result following the occurrence of an incident. Outcomes are analogous to impacts and have a risk ranking attached to them.
Personnel	Includes all people working in and around the site (e.g. all contractors, sub-contractors, visitors, consultants and project managers).
Practicable	The extent to which actions are technically feasible, in view of cost, current knowledge and best practices in existence and under operating circumstances of the time.
Review	An examination of the effectiveness, suitability and efficiency of a system and its components.
Risk	The combination of the potential consequences arising from a specified hazard together with the likelihood of the hazard actually resulting in an unwanted event.

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About Your Report

Your report has been developed on the basis of your unique and specific requirements as understood by **SP Solutions** and only applies to the subject matter investigated. Your report should not be used or at a minimum it **MUST** be reviewed if there are any changes to the project and Key Assumptions. **SP Solutions** should be consulted to assess how factors that have changed subsequent to the date of the report affect the report's recommendations. **SP Solutions** cannot accept responsibility for problems that may occur due to changed factors if they are not consulted.

To avoid misuse of the information contained in the report it is recommended you confer with **SP Solutions** before passing your report on to another party who may not be familiar with the background and the purpose of the report. Your report should not be applied to any project other than that originally specified at the time the report was issued.

Costly problems can occur when other design professionals develop their plans based on misinterpretations of the report. To help avoid misinterpretations of the report, retain **SP Solutions** to work with other professionals who are affected by the report. Have **SP Solutions** explain the report implications to professional affected by them and then review plans and specifications produced to see how they have incorporated the report findings.

The report as a whole presents the findings of the site specific assessment and the report should not be copied in part of altered in any way.

SP Solutions is familiar with a variety of techniques and approaches that are used to identify and reduce a broad range of risks over the life of projects and operations. It is common that not all approaches will be necessarily dealt with in your report due to concepts proposed, recommendations by the team at the time or the scope determined by you. Speak with **SP Solutions** to develop alternative approaches to problems that may be of genuine benefit both in time and cost.

Reporting relies on:

- interpretation of factual information based on judgement and opinion;
- valid and factual inputs supplied by all third parties;
- key assumptions outside the influence of **SP Solutions**; and
- the result of any team based approach to review the topic and is therefore not the result of any one individual or organisation (including **SP Solutions**).

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